

## 3rd Generation Client/Server Systems Emerge

### Corporations Define New Boundaries

Client/server technology is forcing corporations to redefine their boundaries and reach out to customers and suppliers. A major thrust of corporate reengineering efforts is to accelerate business processes using client/server technology. Companies have reduced ordering times from weeks to hours.

How companies implement their software is dictating with whom they can trade. Some companies refuse to deal with suppliers who cannot provide information in specific formats. For example, a retailer was faced with a supplier who demanded that five separate purchase orders be created to order one category of products for separate regions of the country. When the retailer would only cut one purchase order the supplier was forced to make major changes to its ordering systems.

### What Are Third Generation C/S Systems?

To link corporations effectively the third generation of client/server systems is evolving (see Exhibit 1). These three generations of systems co-exist. The **first generation** is relatively simple with all client platforms having the same architecture, usually they are PCs running Microsoft Windows. A single server supports the application, often running a relational database, but alternatively it could support a flat file, engineering or computational application.

The **second generation** is where mainstream client/server systems are being installed now. These support heterogeneous networks with multiple databases and multiple clients. They typically go beyond workgroup computing to support a site or enterprise. Forté, Seer Technologies, Compuware (with Uniface) and Dynasty are just a few of the many software companies providing application development tools for this market.



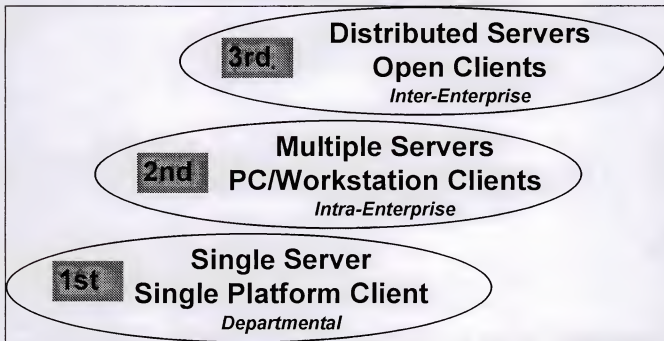
Established vendors, like IBM, provide solutions for specific cross-platform applications using their own tools.

**Third generation** systems are where industry leaders are starting to gain competitive advantage by accelerating business processes and configuring flexible applications. Third generation

systems support a wide range of client software making them suitable for applications to run across enterprise boundaries. They are typically based on object-oriented messaging technology that loosely connects user applications to server systems, that may include databases, mailboxes, files and documents.

Exhibit 1

### Three Generations of Client/Server Systems



Source: INPUT

### Where Are Third Generation Systems Found?

There are four main areas for third generation systems:

- mobile computing
- World Wide Web (WWW) applications
- Lotus Notes applications
- electronic commerce

In mobile computing, AT&T's Personalink service has many characteristics of a third generation client/server system, but lacks the ability to support a wide range of client software. The underlying infrastructure uses General Magic's object-oriented Telescript language that sends agents across a network between server and client. Currently the client software runs on Motorola and Sony personal communicators, but General Magic



expects to make it available on PCs and Apple Macintosh computers.

**WWW applications** have the advantage that they can be created entirely on a server. Client software ranges from text-based LYNX to Netscape's popular browser that supports secure transactions across the Internet. The WWW uses both hypertext and forms-based user interfaces to enable users to view and hear information. Federal Express has a WWW application that allows users to track shipments, download software and request package pick-up.

In the Lotus Notes area, Egghead Software is one of several companies using AT&T's Network Notes to support its sales process. INPUT estimates that the software market for Notes and applications based on it will grow from \$900M in 1995 to \$1.4B in 1999, with a CAGR of 15%. The corresponding services market, including systems integration, professional services and network services, is expected to grow from over \$2B in 1995 to over \$4B in 1999 with a CAGR of over 25%.

**Electronic commerce** vendors are leaders in developing applications that cross enterprise boundaries. Swedish-based Frontec, with a strong presence in the UNIX market, has developed AMTriX, a messaging infrastructure that supports EDI and electronic commerce applications. Harbinger is another EDI vendor broadening its product line to support more messaging applications.

## What Are the Database Vendors Doing?

To leverage sales, software vendors need to identify partners to provide complementary products and services. All the major database vendors are actively pursuing the integration of their systems with messaging infrastructures. All the major databases have interfaces to the WWW and have messaging strategies. This is because the tight integration of client and server is unworkable in large, complex networks and a messaging infrastructure is easier to manage. Informix has formed alliances with Frontec and Netscape. Oracle has an interface called Oracle Agents that can send data over wireless networks. It can be used by Oracle Power Objects, an application development tool, to integrate it with other applications on the desktop. Sybase acquired Complex Architectures in February for its Enterprise Messaging Services technology that integrates database components via wireline and wireless networks.

## How Is Development Changing?

Development is swinging from being focused on the user interface using visual development tools, like Powersoft's PowerBuilder, Microsoft's Visual Basic, Gupta's SQL Windows and ParcPlace's VisualWorks, to being focused on the server. Emerging vendor USoft, funded by Unisys, is promoting server/client computing that focuses primarily on systems design and server functionality. User interfaces can readily be customized later in the process. A server-centric approach to developing client/server systems has the following advantages:



- user interface standards are easier to implement
- central organizations can have control
- systems tend to be easier to scale

The WWW is the ultimate server-centric environment where a web programmer need have no knowledge of the client software. Leading edge corporations are looking to web-like architectures for their internal IS systems so that they do not have to support client system programmers.

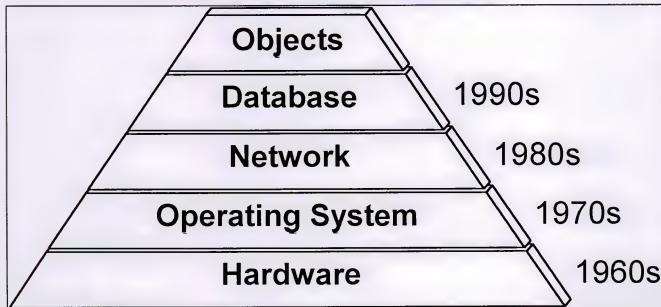
Another trend in development is towards objects and component software. Components may include spreadsheets, reports, files or documents. They may also include low-level objects used by programmers, like scroll bars and icons.

Exhibit 2

The level at which users get locked into software is changing from databases to objects as Exhibit 2 shows. In the 1960s programmers wrote in assembler designed for specific hardware. By the 1990s, the database was added to the list of platforms that a user can get locked into. For the next five years, objects will be the key area that users can be locked into. Who owns the object layer is not clear. It may be Microsoft with OLE, but it may also be an emerging vendor like Taligent.

Another scenario is that there will not be a universal object infrastructure and that separate subsegments of the software industry will support their own architectures. For example, in systems management there are several object-oriented infrastructures emerging from companies like Computer Associates, Candle and Compuware.

The Computing Platform Is Migrating To Objects



Source: INPUT





## Security

Security is a relatively recent addition to messaging infrastructures. Demand for security is fueled by increasingly serious threats. Credit card number threat from Internet access provider Netcom by Kevin Mitnick illustrates the threat posed by hackers. Public key encryption technology, from companies like RSA Data Security, may be used to authenticate users and transactions. As companies connect with messaging infrastructures they need to protect their systems with firewalls. Firewalls enable specific types of information to pass in and out of a corporation. Unlike traditional systems, where security is provided in an application or database, third generation client/server systems will rely on the messaging infrastructure or other middleware to provide security.

## Where Are The Markets?

The main markets for third generation client/server systems are in:

- banking
- retail trade
- telecommunications
- health services

The banking industry, in general a late comer to client/server computing, is now

embracing it enthusiastically as secure protocols emerge. **Banking**, after all, has been at the forefront of secure inter-enterprise computing with its electronic funds transfer networks. Quick Response and Efficient Consumer Response systems in the **retail trade** replenish inventory as needed, thereby reducing inventory holding costs and speeding up ordering. Manufacturers are increasingly managing inventory for retailers using third generation systems. In **telecommunications**, Information Builders' EDA/SQL is used by a major telephone company to integrate cellular billing systems from other carriers. In the **health services** market, community networks linking medical practitioners, clinics and hospitals are another fertile area for third generation systems.

## Summary

Third generation systems will lead to trading communities that have compatible systems. These communities will be at a competitive advantage as they reduce paperwork, speed up business transactions and reduce time wasting negotiations. Selling and marketing third generation systems requires vendors to cross-train personnel in a variety of technical and business disciplines to succeed.

---

This Research Bulletin is issued as part of INPUT's Client/Server Software Program. If you have questions or comments on this bulletin, please call your local INPUT organization or Angela M. Hey at INPUT, 1881 Landings Drive, Mountain View, CA 94043-0848, (415) 961-3300.

---



# INPUT®

Clients make informed decisions more quickly and economically by using INPUT's services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

Contact us today to learn how your company can use INPUT's knowledge and experience to grow and profit in the revolutionary IT world of the 1990s.

## SUBSCRIPTION SERVICES

- Information Services Markets
  - Worldwide and country data
  - Vertical industry analysis
- Systems Integration/Professional Services Markets
- Client/Server Software
- Outsourcing Markets
- Information Services Vendor Profiles and Analysis
- Electronic Commerce/Internet
- U.S. Federal Government IT Markets
- IT Customer Services Directions (Europe)

## SERVICE FEATURES

- Research-based reports on trends, etc. (More than 100 in-depth reports per year)
- Frequent bulletins on events, issues, etc.
- 5-year market forecasts
- Competitive analysis
- Access to experienced consultants
- Immediate answers to questions
- On-site presentations

## DATABASES

- Software and Services Market Forecasts
- Software and Services Vendors
- U.S. Federal Government
  - Procurement Plans (PAR, APR)
  - Forecasts
  - Awards (FAIT)

## CUSTOM PROJECTS

For Vendors—analyze:

- Market strategies and tactics
- Product/service opportunities
- Customer satisfaction levels
- Competitive positioning
- Acquisition targets

For Buyers—evaluate:

- Specific vendor capabilities
- Outsourcing options
- Systems plans
- Peer position

## OTHER SERVICES

Acquisition/partnership searches

## INPUT WORLDWIDE

### Frankfurt

Perchstätten 16  
D-35428  
Langgöns  
Germany  
Tel. +49 6403-911-420  
Fax +49 6403-911-413

### London

Cornwall House  
55-77 High Street  
Slough, Berkshire  
SL1 1DZ, England  
Tel. +44 (0) 1753 530444  
Fax +44 (0) 1753 577311

### New York

400 Frank W. Burr Blvd.  
Teaneck, NJ 07666  
U.S.A.  
Tel. 1 (201) 801-0050  
Fax 1 (201) 801-0441

### Paris

24, avenue du Recteur  
Poincaré  
75016 Paris  
France  
Tel. +33 (1) 46 47 65 65  
Fax +33 (1) 46 47 69 50

### San Francisco

1881 Landings Drive  
Mountain View  
CA 94043-0848  
U.S.A.  
Tel. 1 (415) 961-3300  
Fax 1 (415) 961-3966

### Tokyo

Saida Building, 4-6,  
Kanda Sakuma-cho  
Chiyoda-ku, Tokyo 101  
Japan  
Tel. +81 3 3864-0531  
Fax +81 3 3864-4114

### Washington, D.C.

1921 Gallows Road  
Suite 250  
Vienna, VA 22182-3900  
U.S.A.  
Tel. 1 (703) 847-6870  
Fax 1 (703) 847-6872

